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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|-----------------|-------------|----------------------|---------------------|------------------|
| 09/779,032 | 02/07/2001 | Punam Kumar Saha | 22253-68248 | 4435 |

27730 7590 10/06/2003

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| EXAMINER |
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AZARIAN, SEYED H

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| ART UNIT | PAPER NUMBER |
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2625

DATE MAILED: 10/06/2003

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Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/779,032

Applicant(s)

SAHA ET AL.

Examiner

Seyed Azarian

Art Unit

2625

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 February 2001.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-21 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 07 February 2002 is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in a patent granted on an application for patent by another filed in the United States before the invention thereof by the applicant for patent, or on an international application by another who has fulfilled the requirements of paragraphs (1), (2), and (4) of section 371(c) of this title before the invention thereof by the applicant for patent.

2. Claims 1 and 2, are rejected under 35 U.S.C. 102(e) as being anticipated by Pierpaoli et al (U.S. patent 5,969,424).

Regarding claim 1, Pierpaoli et al discloses method to significantly reduce bias and variance of diffusion anisotropy measurements comprising;

of post-acquisition processing an MRI-acquired image by variant anisotropic filtering to enhance structure and reduce noise (column 15, lines 44-56, measuring of inisotropy and differentiation of anisotropic tissue from isotropic tissue also column 10, lines 44-58, calculation for reducing noise and variance anisotropy).

Regarding claim 2, Pierpaoli et al discloses the method, comprising improving a low signal-to-noise ratio, or improving a low contrast-to-noise ratio, or improving both (Fig. 2B column 4, lines 8-13, function of the signal-to-noise ratio and column 10, lines 48-54, by way of contrast with conventional averaging techniques used to reduced noise).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claims 3-21, are rejected under 35 U.S.C. 103(a) as being unpatentable over Pierpaoli et al (U.S. patent 5,969,524) in view of Filler et al (U.S. patent 5,560,360).

Regarding claim 3, Pierpaoli et al discloses the method, wherein filtering comprises a adaptive scale computation method (column 5, lines 48-56, acquire numerous high-resolution DWIs, and column 12, lines 12-20, a standard deviation scaled).

However Pierpaoli et al is silent about "spatial-resolution". On the other hand Filler et al teaches (column 10, lines 45-58, providing an improvement in the spatial resolution and allowing information to be retrieved to form useful images).

5, lines 9-21, transformation a portion of the totally impressive representation with distortion and perspective correction and display).

Therefore it would have been obvious to one having ordinary skill in the art at the time of the invention was made, to modify Pierpaoli et al invention according to the teaching of Filler et al because it provides and enhance the contrast of neural tissue relative to surrounding tissue and

Art Unit: 2625

desired images which can easily be implemented in an imaging device such as magnetic resonance images.

Regarding claim 4, Pierpaoli et al discloses the method, comprising accurately using a restricted homogeneity parameter for filtering small scale regions of the image, and at the same time, using a generous filtering parameter for filtering large scale regions of the image (column 9, lines 18-33, refer to homogeneous, as the SNR decreases, the variance and column 8, lines 47-56, different parameter).

Regarding claim 8, Pierpaoli et al discloses the method, wherein filtering comprises a weighted average over a scale dependent neighborhood (column 8, lines 12-21, calculating a weighted average of ROI).

Regarding claim 9, Pierpaoli et al discloses the method, wherein filtering comprises a scale-based diffusive filtering method (Fig. 1, column 4, lines 38-52, refer to diffusion weighted resonance (MR)).

Regarding claim 12, Pierpaoli et al discloses the method, wherein the image is enhanced independent of variations within or between patients, within or between tissues being imaged, or within or between MR devices used to acquire the image (column 5, lines 58 through column 6, line 6, the multivariate regression routine accounts for background noise levels).

Regarding claim 14, Pierpaoli et al discloses the method according to claim 11, which is built into an MR scanner, permitting production of enhanced real time images (column 15, lines 55-67, enhancing the image and MRI).

Regarding claims 5-7 and 11, it recites similar limitation as claims 1 and 4, are similarly analyzed.

Art Unit: 2625

Regarding claims 10, 13 and 15-17, it recites similar limitation as claims 9 and 12, are similarly analyzed.

Regarding claims 18-21, it recites similar limitation as claims 4 and 5, are similarly analyzed.

Other prior art cited

5. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

U.S. patent (6,249,121) to Boskamp et al is cited for RF body coil.

U.S. patent (6,159,445) to Klaveness et al is cited for light imaging contrast agents.

U.S. patent (5,528,365) to Gonatas et al is cited for method and apparatus for imaging with diffuse light.

U.S. patent (5,644,646) to Du et al is cited for vessel enhancement filtering in magnetic resonance angiographies.

U.S. patent (6,556,720) to Avinash is cited for method and apparatus for enhancing and correcting digital images.

U.S. patent (5,991,701) to Triano is cited for method for improved instantaneous helical axis determination.

Contact Information

6. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Seyed Azarian whose telephone number is (703) 306-5907.

Art Unit: 2625

The examiner can normally be reached on Monday through Thursday from 6:00 a.m. to 7:30 p.m. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Bhavesh Mehta, can be reached at (703) 308-5246.

Any response to this action should be mailed to:

Assistant Commissioner for Patents
Washington, D.C. 20231

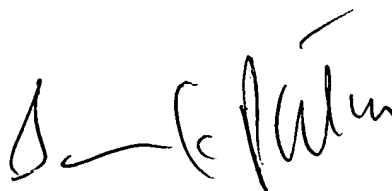
Or faxed to:

(703) 872-9306, ("draft" or "informal" communications should be clearly labeled to expedite delivery to examiner).

Hand delivered responses should be brought to Crystal Park II, 2121 Crystal Drive, Arlington, VA., Sixth Floor (Receptionist).

Any inquiry of a general nature or relating to the status of this application should be directed to T.C. customer service office whose telephone number is (703) 306-0377.

Seyed Azarian
Patent Examiner
Group Art Unit 2625
September 28, 2003



Jayanti K. Patel
Primary Examiner

